

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
29 November 2001 (29.11.2001)

PCT

(10) International Publication Number  
**WO 01/090748 A3**

(51) International Patent Classification<sup>7</sup>: **G01N 27/447**

(21) International Application Number: **PCT/US01/16187**

(22) International Filing Date: **18 May 2001 (18.05.2001)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:  
**60/205,832** **19 May 2000 (19.05.2000)** **US**

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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

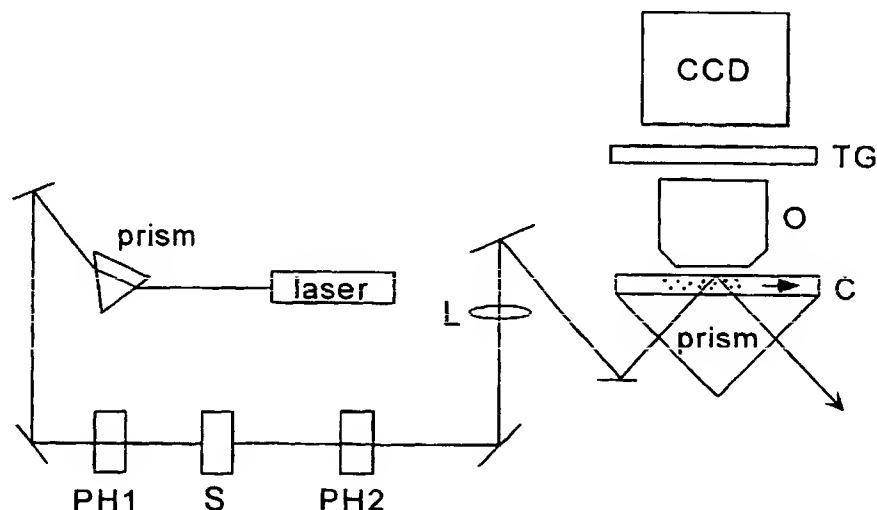
Published:

— *with international search report*

(88) Date of publication of the international search report:  
**6 February 2003**

[Continued on next page]

(54) Title: **HIGH-THROUGHPUT METHODS OF DISTINGUISHING AT LEAST ONE MOLECULE INDIVIDUALLY IN A SAMPLE COMPRISING MULTIPLE MOLECULES AND SYSTEMS FOR USE THEREIN**



(57) Abstract: A high-throughput method of distinguishing at least one molecule individually in a sample comprising multiple molecules, which method comprises: subjecting a sample comprising multiple molecules, at least one molecule of which is detectably labeled, to electrophoresis; imaging the electrophoretic mobility of each detectably labeled molecule over time by detecting the position of the detectable label of each detectably labeled molecule over time, and, optionally, at the same time, dispersing the imaging by a transmission grating for spectroscopic analysis, and determining the electrophoretic mobility of each detectably labeled molecule and, optionally, determining the molecular spectrum of each detectably labeled molecule, thereby distinguishing at least one molecule individually in a sample comprising multiple molecules, and a system for use in such a method.

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>211389</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/US 01/16187</b>	International filing date (day/month/year) <b>18/05/2001</b>	(Earliest) Priority Date (day/month/year) <b>19/05/2000</b>
Applicant <b>IOWA STATE UNIVERSITY RESEARCH FOUNDATION, INC.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2.



**Certain claims were found unsearchable** (See Box I).

3.



**Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

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RECEIVED**

**AUG 15 2002**

PAT/TM Due Date

9/9/02

**LAH**

**AHF**

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 11



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 01/16187

## B x III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

A high-throughput method of distinguishing at least one molecule individually in a sample comprising multiple molecules, which method comprises: subjecting a sample comprising multiple molecules, at least one molecule of which is detectably labeled, to electrophoresis; imaging the electrophoretic mobility of each detectably labeled molecule over time by detecting the position of the detectable label of each detectably labeled molecule over time, and, optionally, at the same time, dispersing the imaging by a transmission grating for spectroscopic analysis, and determining the electrophoretic mobility of each detectably labeled molecule and, optionally, determining the molecular spectrum of each detectably labeled molecule, thereby distinguishing at least one molecule individually in a sample comprising multiple molecules, and a system for use in such a method.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/16187

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01N27/447

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 766 048 A (FLYGARE W ET AL) 16 October 1973 (1973-10-16) column 3, line 7 -column 4, line 30; figure 1 ---	1,21,30, 48
Y	US 5 215 883 A (CHU BENJAMIN) 1 June 1993 (1993-06-01) column 4, line 15 - line 59 ---	1,21,30, 48
A	US 5 723 031 A (HELBIG LOTHAR ET AL) 3 March 1998 (1998-03-03) abstract ---	1
A	US 5 599 664 A (SCHWARTZ DAVID C) 4 February 1997 (1997-02-04) column 11, line 16 - line 24 ---	1
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
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- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*&\* document member of the same patent family

Date of the actual completion of the international search

5 August 2002

Date of mailing of the international search report

09/08/2002

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/16187

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 238 767 A (ALTMANN JURGEN ET AL) 9 December 1980 (1980-12-09) abstract; figure 1 ---	1
A	GB 2 335 981 A (ZETATRONICS LTD) 6 October 1999 (1999-10-06) abstract; figure 3 ---	1
A	WO 99 40410 A (CLEVELAND CLINIC FOUNDATION ;UNIV OHIO (US)) 12 August 1999 (1999-08-12) abstract; figure 1 -----	1

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Information on patent family members

International Application No

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